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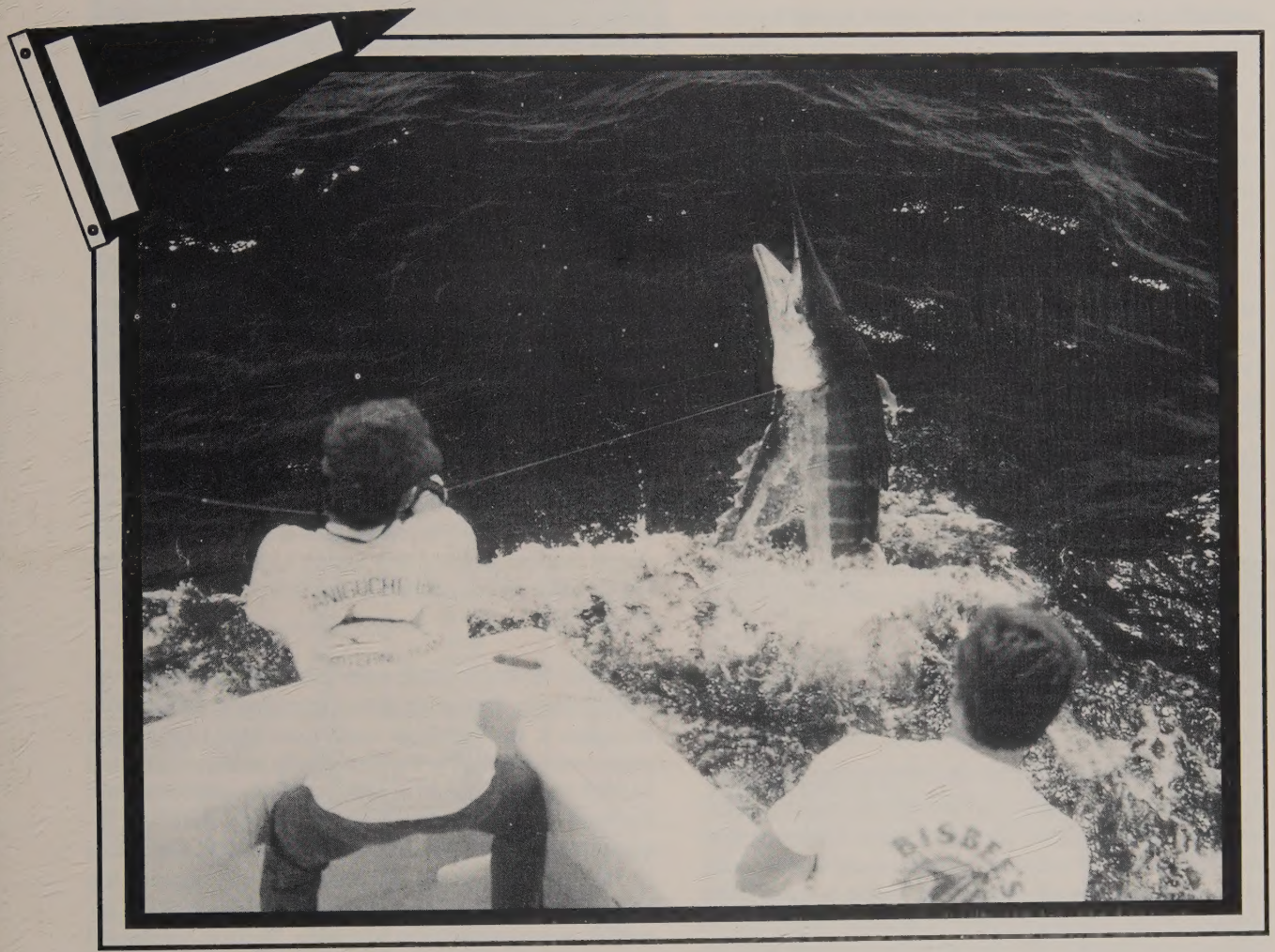
*The Southwest Fisheries Science Center's*

# 1999 Billfish Newsletter



## Results of Cooperative Programs

- Trends in 1998 Billfish angler catch rates
- 1998 Billfish tagging and recoveries
- AFTCO's Pacific Tag-Flag Tournament Results
- New Tag Design
- Circle Hooks

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOAA
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## INTRODUCTION

The Southwest Fisheries Science Centers's (SWFSC) billfish research is specifically designed to provide information for the conservation and rational management of billfish resources in the Pacific. Our commitment is to provide sound fishery data analysis, fishery management information and advice for the U.S. Fishery Management Councils and international agencies. Four of the SWFSC's primary objectives for billfish research are:

1) monitor recreational and commercial fisheries
2) conduct research into the biology and ecology of specific billfish species
3) conduct stock assessment of the billfish resource
4) determine the economic importance of billfish resources

This Billfish Newsletter is an annual publication that describes two of the primary components of billfish research at the SWFSC. The *International Billfish Angling Survey* and the *Billfish Tagging Program* produces essential information pertaining to the recreational billfish angling community and for exploring management concerns. The *Billfish Angler Survey* provides catch and angler effort information from the recreational fisheries. The *Billfish Tagging Program* provides much needed data on the biology, distribution and migration rates of these far ranging species. Both investigations rely on continued cooperation from billfish anglers, sport fishing clubs, commercial fishers and agencies affiliated with the SWFSC.

## THE INTERNATIONAL BILLFISH SURVEY

The *International Billfish Angler Survey* began in 1969 and produces information on recreational anglers' billfish catch and fishing effort. The information developed from this *Survey* is used to indicate trends in angler catch rates in specific areas in the Pacific and Indian oceans. These trends, of the average number of billfish caught per an angler's day fishing, are important in understanding the impact of fisheries on billfish resources.

These catch rates are annual means, calculated over the entire reporting year, and do not indicate seasonal highs or lows encountered in any particular region. Trend analysis on observed performance over a period of time can be conducted and related to the effects of commercial catches, weather patterns or local economic changes. Monitoring these trends is particularly important because of the continued level of fishing effort expended on pelagic fish throughout our oceans. Trends produced by the *Billfish Angler Survey* help us monitor the impact of pelagic fisheries and can highlight the importance of recreational fishing for billfish.

## SURVEY RESPONSE

**Your response to the *Billfish Angler Survey* is needed to befter determine the trend of angler catch rates and provide an index of the health of the billfish stocks important to recreational fisheries.**

**The *Billfish Angler Survey* card for fishing in the 1999 calendar year, will be mailed out in December of this year. Please complete the survey card and return it by February 2000. Additional 1999 *survey* cards will be available to billfish anglers through this office. U.S. Government regulations require that we purge our mailing list each year. If you wish to continue to receive the *Billfish Newsletter* but did not fish, please indicate "NO FISHING" on the *Billfish Angler Survey* form and return it to the Center. Your name will be retained.**

In 1998, 585 billfish anglers reported catching 3,715 billfish during 8,748 fishing days. The overall catch per effort (measured in catch per day fished) was 0.42 billfish per angler-day in 1998 and 0.44 in 1997 (Table 1). The total number of angler-days reported for 1998 decreased nearly 23% over 1997. In 1997, anglers reported catching 5,054 billfish during 11,413 days of fishing. The current overall catch rate of 0.42 (1998) to 0.44 (1997) is slightly lower than the prior four-year average of 0.47 (1994 to 1997). The highest reported catch rate (0.57) occurred during the first years of this Survey (1969 to 1971). The lowest catch rates occurred in the mid-1970s, averaging about 0.34.

Trends in angler catch rates recorded throughout the *Billfish Angler Survey* are shown graphically, by location, in Figure 1. In 1998, high catch rates (0.41) for striped marlin were reported at the southern tip of Baja California Sur and were 0.33 for all of Mexico. High catch rates were reported for blue marlin in Hawaii (0.15), Solomon Islands (0.21), Mauritius (0.29), Kiribati (0.23), and Tahiti (0.36). Australia (0.23) and Panama (0.12) reported the highest catch rates for black marlin. Excellent fishing for sailfish was reported from Mazatlan, Mexico, southward through southern Mexico (0.60), Guatemala (3.45), Costa Rica (1.51) and Panama (0.68). Anglers in the Indian Ocean reported 1.94 sailfish per angler day with excellent fishing in the Persian Gulf (U.A.E., 5.81) and Maldives (0.70).

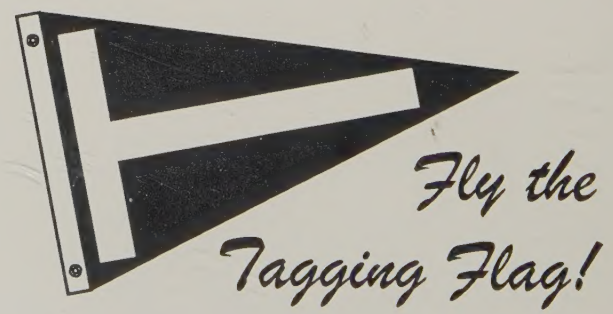


**Table 1.** Results of 1998 *Billfish Angler Survey*. Data in parentheses are values recorded in 1997. Species codes are striped marlin (SM), blue marlin (BLM), black marlin (BKM), and sailfish (SF).

| LOCATION | ANGLER FISHING DAYS | BILLFISH PER FISHING DAY (CPUE) | MAJOR SPECIES |
|---|---|---|---|
| **PACIFIC OCEAN** | | | |
| Hawaii, U.S.A. | 3,429 (5,410) | 0.29 (0.38) | BLM |
| Southern California, U.S.A. | 1,738 (2,430) | 0.14 (0.12) | SM |
| Baja California, Mexico | 1,595 (1,643) | 0.67 (0.75) | SM |
| Guaymas, Mexico | 16 (44) | 0.06 (0.32) | SM |
| Mazatlan, Manzanillo, Mexico | 249 (95) | 0.49 (0.55) | SF |
| Puerto Vallarta Mexico | 37 (22) | 0.32 (0.27) | SF |
| Acapulco, Ixtapa, Zihuatanejo, Mexico | 94 (54) | 1.52 (1.31) | SF |
| Huatulco, Mexico | 2 (0) | 0.50 (0) | SF |
| Guatemala | 38 (33) | 3.50 (8.24) | SF |
| Costa Rica | 59 (97) | 1.80 (1.59) | SF |
| Panama | 109 (152) | 0.86 (1.51) | SF |
| Colombia | 15 (25) | 0.33 (0.20) | SF |
| Japan | 75 (24) | 0.09 (0.37) | BLM |
| Guam, U.S.A. | 15 (2) | 0.13 (1.50) | BLM |
| Papua New Guinea | 50 (29) | 0.04 (0.21) | BLM |
| Marshall Islands | 115 (83) | 0.12 (0.29) | BLM |
| Kiribati | 47 (60) | 0.89 (0.40) | SF |
| Fiji | 8 (39) | 0 (0.21) | SF |
| Tahiti, French Polynesia | 56 (45) | 0.57 (0.42) | BLM |
| New Caledonia, Solomon Islands | 150 (0) | 0.44 (0) | BLM |
| Australia | 114 (141) | 0.39 (0.89) | BKM |
| New Zealand | 571 (144) | 2.65 (0.65) | SM |
| **INDIAN OCEAN** | | | |
| Kenya | 5 (89) | 0.80 (1.33) | SM |
| Mauritius | 28 (10) | 0.36 (0.40) | BLM |
| Maldives | 161 (7) | 0.70 (0.14) | SF |
| United Arab Emeritus | 68 (21) | 5.81 (2.57) | SF |
| **ATLANTIC OCEAN** | | | |
| Atlantic total | 131 (306) | 0.16 (0.21) | SF |

## THE BILLFISH TAGGING PROGRAM

The *Billfish Tagging Program*, began as the Cooperative Marine Gamefish Tagging Program in 1963. Release and recapture data from tagged billfish are utilized to determine movement, distribution and growth patterns of billfish. The program encourages the participation and cooperation of recreational anglers, sportfishing organizations and commercial fishers. The SWFSC is currently concentrating its tagging efforts at selected locations throughout the Pacific and Indian Oceans. With the establishment of the *Billfish Tagging Program*, the SWFSC's tagging priorities emphasized the tagging of all species of billfish. More than 44,400 billfish have been tagged and released throughout the Pacific and Indian Oceans (Table 2). Our tagging priorities occasionally change to emphasize current needs. Tagging of striped marlin and swordfish continued to be necessary off southern California. Off Baja California Sur, we are emphasizing blue marlin, black marlin and swordfish. We are now emphasizing the tagging of swordfish, striped, blue and black marlin from

**Table 2.** Summary of all fish tagged in 1998 with releases and recoveries for 1963-1998.

| Species Name | Releases 1998 | Releases Total | Recoveries Number | Rate% |
|---|---|---|---|---|
| Striped Marlin | 230 | 20,059 | 326 | 1.63 |
| Sailfish | 161 | 7,559 | 34 | 0.45 |
| Blue Marlin, Pacific | 171 | 4,997 | 48 | 0.96 |
| Billfish, unid. | 11 | 4,273 | 4 | 0.09 |
| Black Marlin | 4 | 3,342 | 69 | 2.06 |
| Shortfin Mako Shark | 20 | 1,113 | 25 | 2.25 |
| Roosterfish | | 920 | 29 | 3.15 |
| Short-billed Spearfish | 46 | 693 | 0 | 0.00 |
| Broadbill Swordfish | 2 | 494 | 14 | 2.83 |
| Yellowtail | | 492 | 36 | 7.32 |
| Dolphinfish (Mahi Mahi) | | 407 | 3 | 0.74 |
| Yellowfin Tuna | 3 | 342 | 25 | 7.31 |
| Blue Shark | 3 | 313 | 5 | 1.60 |
| Skipjack Tuna | | 97 | 2 | 2.06 |
| Bat Ray | | 84 | 0 | 0.00 |
| Albacore Tuna | | 79 | 0 | 0.00 |
| Bigeye Tuna | | 76 | 2 | 2.63 |
| Thresher Shark | 32 | 62 | 3 | 4.84 |
| Hammerhead Shark | 1 | 52 | 2 | 3.85 |
| White Sturgeon | | 50 | 1 | 2.00 |
| Black Sea Bass | | 40 | 8 | 20.00 |
| Leopard Shark | | 39 | 1 | 2.56 |
| Bronze Whaler Shark | | 36 | 1 | 2.78 |
| Whitetip Shark | 3 | 36 | 0 | 0.00 |
| Wahoo | | 35 | 3 | 8.57 |
| Jack Crevalle | | 32 | 0 | 0.00 |
| Blue Crevalle | | 30 | 1 | 3.33 |
| Barracuda | | 23 | 2 | 8.70 |
| Bluefin Tuna | | 19 | 1 | 5.26 |
| Tiger Shark | | 17 | 2 | 11.76 |
| White Marlin | | 13 | 1 | 7.69 |
| Whale Shark | | 5 | 1 | 20.00 |
| All Others | 4 | 287 | 8 | 2.78 |
| Totals | 691 | 46,116 | 657 | 1.42 |

**Figure 1.** CPUE (number of fish/angler day) for blue marlin, striped marlin, black marlin, and sailfish reported by region, 1969-1998.

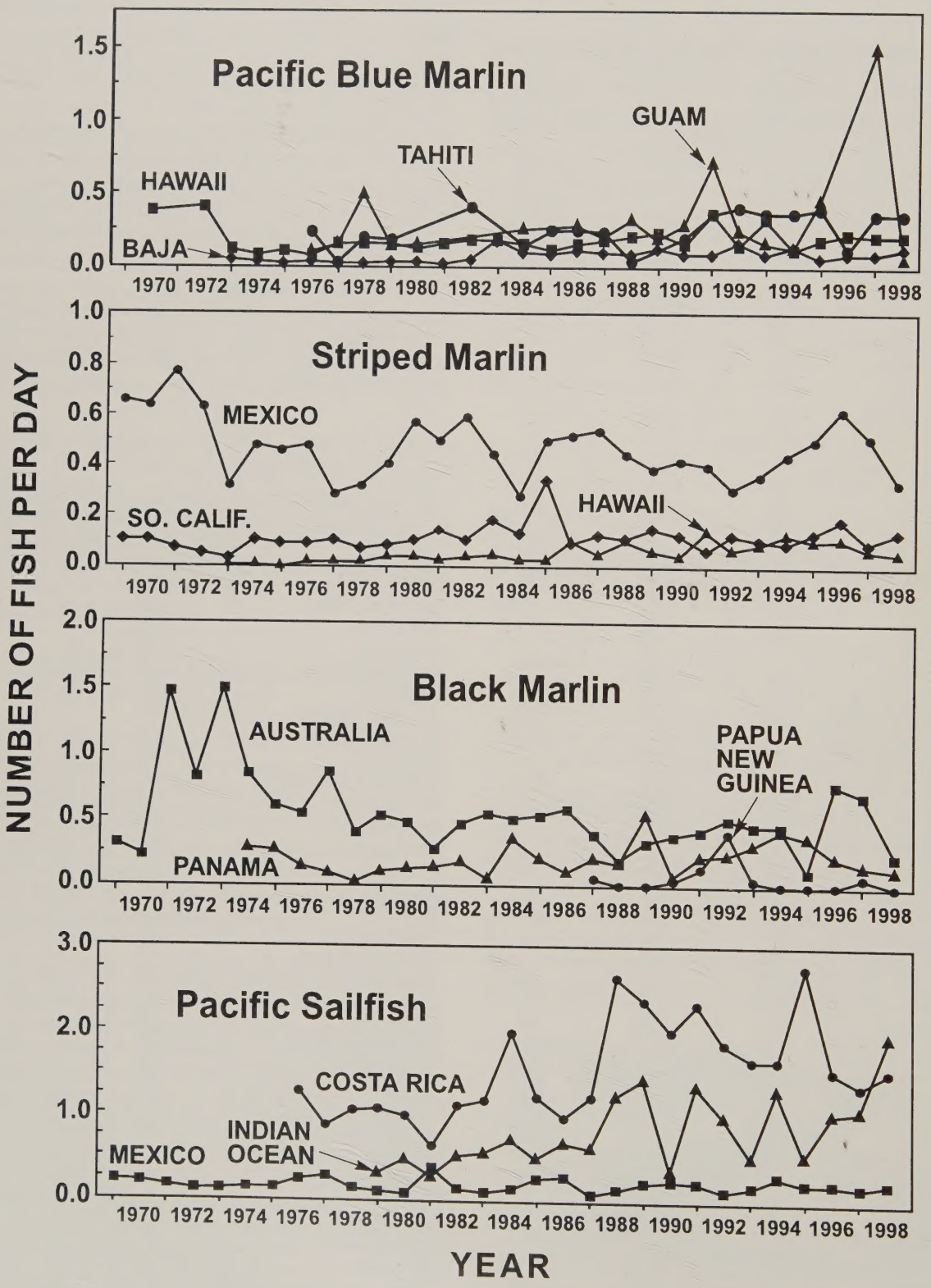


**Table 3.** Summary of billfish tagged in 1998.

| AREA | SPECIES | TOTAL |
|---|---|---|
| **PACIFIC OCEAN** | | |
| Southern California, U.S.A. | Blue Marlin | 1 |
| | Striped Marlin | 97 |
| | Broadbill Swordfish | 1 |
| Hawaii, U.S.A. | Blue Marlin | 117 |
| | Striped Marlin | 53 |
| | Black Marlin | 1 |
| | Short-billed Spearfish | 46 |
| | Broadbill Swordfish | 1 |
| | Sailfish | 2 |
| | Marlin, unid. | 1 |
| | Billfish, unid. | 1 |
| Baja California, Mexico | Blue Marlin | 31 |
| | Black Marlin | 1 |
| | Striped Marlin | 76 |
| | Sailfish | 23 |
| | Marlin, unid. | 9 |
| Mazatlan, Puerto Vallarta, Mexico | Blue Marlin | 2 |
| Manzanillo, Acapulco, Mexico | Blue Marlin | 10 |
| | Striped Marlin | 2 |
| | Sailfish | 9 |
| Revillagigedo Island, Mexico | Sailfish | 1 |
| Guatemala | Sailfish | 10 |
| Nicaragua | Sailfish | 12 |
| Costa Rica | Black Marlin | 2 |
| | Striped Marlin | 1 |
| | Sailfish | 3 |
| Panama | Sailfish | 1 |
| Midway Island | Blue Marlin | 2 |
| Marshall Islands | Blue Marlin | 3 |
| Tahiti, French Polynesia | Blue Marlin | 1 |
| Fiji | Blue Marlin | 2 |
| Vanuatu | Blue Marlin | 1 |
| | Striped Marlin | 1 |
| | Sailfish | 1 |
| **INDIAN OCEAN** | | |
| Mauritius | Blue Marlin | 1 |
| Maldive Islands | Sailfish | 3 |
| United Arab Emirates | Sailfish | 96 |
| TOTAL | | 625 |

all other areas of the Pacific and Indian Oceans. Tagging of other non-billfish species such as tunas, wahoo, sharks are outside the scope of current studies and do not support the current goals of the *Billfish Tagging Program.*

The Billfish Tagging Report cards received in 1998 indicate a total of 625 billfish were tagged and released by 375 anglers and 176 fishing captains (Table 3). This is 29% fewer tag releases than in 1997. The number of striped marlin tagged off southern California (97) remained about the same as the four-year average (98). Far fewer tags were released in Hawaiian waters than in past years. Only 222 billfish were tagged compared to an average of 540 in recent years. Tagging of Baja California Sur, Mexico also remained similar to past records.

We gratefully recognize the anglers, captains and fishers who tag and release billfish. In 1998, 375 individual anglers reported tagging at least one billfish. Individual recognition of each angler who reported tagging two or more billfish in 1998 is listed in Table 4. We regret not being able to acknowledge all the anglers who tagged billfish by name in this year's newsletter. We also list the captains of charter and private boats who tagged significant numbers of billfish in specific regions (Table 5). Continued interest and cooperation by these captains have greatly enhanced the *Billfish Tagging Program*, and their efforts are truly appreciated.

**Table 4.** Names of anglers tagging substantial numbers of billfish, and the number of billfish tagged and released. From *Billfish Tagging Report* cards received for 1998 calendar year releases.

| ANGLER NAME | BILLFISH TAGGED |
|---|---|
| **HAWAII, U.S.A.** | |
| Don Brandt | 4 |
| Peter Clark | 3 |
| Henry Potts | 3 |
| James Anderson | 2 |
| Ray Bartoces | 2 |
| Barry H. Bovee | 2 |
| Dan Doherr | 2 |
| Richard Fisher | 2 |
| A. W. Jeffreys III | 2 |
| Herman S. Jones | 2 |
| Paul Kennedy | 2 |
| Michael Perez | 2 |
| Robert Ragland | 2 |
| Sue Stolzman | 2 |
| Ichiro Takahashi | 2 |
| Tetsuya Toda | 2 |
| Ken W. Valder | 2 |
| Anthony J. Weed | 2 |
| **BAJA CALIFORNIA, MEXICO** | |
| Don Anderson | 18 |
| Mark Brackmann | 8 |
| Clarke A. Smith | 6 |
| Douglas Bear | 4 |
| John Algeo | 3 |
| Don Bear | 3 |
| Gary Jasper | 3 |
| William R. Woodard | 3 |
| Gerald Brennock | 2 |
| Bill Crutchfield | 2 |
| Ronald Donnally | 2 |
| Matt Eschenburg | 2 |
| Mike Gesselman | 2 |
| Jon Henrichsen | 2 |
| Andreas Kotzur | 2 |
| Gerald Lester | 2 |
| Ted Marshall | 2 |
| Leo Moyneur | 2 |
| David Reed | 2 |
| Arthur Schwartz | 2 |
| **SOUTHERN CALIFORNIA, U.S.A.** | |
| Kathy Henderson | 9 |
| David M. Denholm | 5 |
| Don Schumacher | 4 |

| ANGLER NAME | BILLFISH TAGGED |
|---|---|
| **SOUTHERN CALIFORNIA, U.S.A. (Continued)** | |
| Douglas A. Daniels | 3 |
| Dean Plant | 3 |
| Eric Grennan | 2 |
| Geoff Halpern | 2 |
| Jim Hori | 2 |
| Chris Hull | 2 |
| Gary Jasper | 2 |
| Karl Kogler | 2 |
| Jim Madden | 2 |
| Marc Muller | 2 |
| Harry Okuda | 2 |
| Mike Petersen | 2 |
| Michael Thomas | 2 |
| Mike Yeager | 2 |
| **MANZANILLO-ACAPULCO, MEXICO** | |
| Denise Carton | 4 |
| Bob Kubinski | 2 |
| **COSTA RICA, CENTRAL AMERICA** | |
| Steven Crouch | 5 |
| **GUATEMALA, CENTRAL AMERICA** | |
| John Murray | 3 |
| Thomas W. Murray | 3 |
| Nancy L. Murray | 2 |
| Sean T. Murray | 2 |
| **NICARAGUA, CENTRAL AMERICA** | |
| Thomas W. Murray | 7 |
| Nancy L. Murray | 3 |
| **FIJI ISLANDS** | |
| Melvin Threadingham | 2 |
| **VANUATU** | |
| Marsha Bierman | 3 |
| **UNITED ARAB EMIRATES** | |
| John Hoolihan | 83 |
| Barry W. Panzer | 5 |
| Andy Demare | 4 |
| Greg Clark | 2 |
| Rick Le Monnier | 2 |

**Table 5.** Names of captains tagging substantial numbers of billfish, and the number of billfish tagged and released. From *Billfish Tagging Report* cards received for 1998 calendar year releases.

| CAPTAIN NAME | TOTAL |
|---|---|
| **HAWAII, U.S.A.** | |
| Capt. Tony Clark | 16 |
| Capt. John Jordan | 16 |
| Capt. Kelley Everette | 10 |
| Capt. Jerry Allen | 7 |
| Capt. Kent Mongreig | 7 |
| Capt. Mark Shultz | 7 |
| Capt. Sean Cleaver | 6 |
| Capt. Bill Crawford | 6 |
| Capt. Scott M. Fuller | 6 |
| Capt. Mike Derego | 5 |
| Capt. Kevin M. Hogan | 5 |
| Capt. Neal Isaacs | 5 |
| Capt. Bill Casey | 4 |
| Capt. Jeff Fay | 4 |
| Capt. Robert McGuckin | 4 |
| Capt. F. McGrew Rice | 4 |
| Capt. Freeman A. Roberts | 4 |
| Capt. Guy Terwilliger | 4 |
| Capt. Alan Abdill | 3 |
| Capt. Karl Adams | 3 |
| Capt. Doug Barna | 3 |
| Capt. Dennis R. Cintas | 3 |
| Capt. Del Dykes | 3 |
| Capt. Charles E. Haupert | 3 |
| Capt. Peter Hoogs | 3 |
| Capt. Gus Sellers | 3 |
| Capt. Russell Tanaka | 3 |
| Capt. Doug Armfield | 2 |
| Capt. Michael Bernstone | 2 |
| Capt. Frank R. Boyd | 2 |
| Capt. Darryl Chow | 2 |
| Capt. James C. Dean | 2 |
| Capt. Joseph Demarke | 2 |
| Capt. C. Bruce Evans | 2 |
| Capt. Chip Fischer | 2 |
| Capt. Vernon Goakes | 2 |
| Capt. Dennis Harris | 2 |
| Capt. Mike Hasbrouck | 2 |
| Capt. Darrin Isaacs | 2 |
| Capt. Jeff Kahl | 2 |
| Capt. Steven D. Kaiser | 2 |
| Capt. Michael M. Kenworthy | 2 |
| Capt. Randy Llanes | 2 |
| Capt. Tad Luckey | 2 |
| Capt. Fran O'Brien | 2 |
| Capt. Randy O. Orkisch | 2 |
| Capt. Marlin Parker | 2 |
| Capt. Chris Rose | 2 |
| Capt. Marty L. Sands | 2 |
| **BAJA CALIFORNIA, MEXICO** | |
| Capt. John Beatty | 13 |
| Capt. Martin Verdugo Collins | 13 |
| Capt. Alberto Cota | 11 |
| Capt. David E. Brackmann | 9 |
| Capt. Paulino Martinez | 8 |
| Capt. Billy Miyagawa Jr. | 8 |
| Capt. Peter E. Wishney | 8 |
| Capt. Luis Olascoaga | 6 |
| Capt. Thomas A. Shanahan | 6 |
| Capt. Martin Luce Lucero | 5 |
| Capt. Cooke Bausman III | 3 |
| Capt. Mark Henwood | 3 |
| Capt. Kendall W. Knight Jr. | 3 |
| Capt. Gerald Lester | 3 |
| Capt. Eric A. Wahrenbrock | 3 |
| Capt. John Algeo | 2 |
| Capt. Greg Donnally | 2 |
| Capt. Donald G. Goodwin | 2 |
| Capt. Ken Knight Sr. | 2 |
| Capt. P. Neff Nash | 2 |
| Capt. Brad Titcomb | 2 |
| Capt. Bob Woodard | 2 |
| Capt. Robert L. Woodard | 2 |
| **SOUTHERN CALIFORNIA, U.S.A.** | |
| Capt. Stan Ecklund Sr. | 9 |
| Capt. Michael R. Hurt | 7 |
| Capt. Ned Falschlehner | 6 |
| Capt. Jim Madden | 6 |
| Capt. Jerry R. Austin | 5 |
| Capt. Jack Patterson | 5 |
| Capt. Kendall W. Knight Jr. | 4 |
| Capt. Martin L. Morris | 4 |
| Capt. Sara Schumacher | 4 |
| Capt. Tom Hargraves | 3 |
| Capt. Thomas A. Shanahan | 3 |
| Capt. Richard Sieminski | 3 |
| Capt. Ken Brookins | 2 |
| Capt. Tad Cordry | 2 |
| Capt. Edward J. Day | 2 |
| Capt. Chris Hull | 2 |
| Capt. Ron Johnson | 2 |
| Capt. Tony LeBlanc | 2 |
| Capt. Harold E. Neibling | 2 |
| Capt. Douglas C. Williams | 2 |
| **MANZANILLO-ACAPULCO, MEXICO** | |
| Capt. Peter E. Wishney | 8 |
| Capt. Billy Miyagawa Jr. | 6 |
| Capt. Edward J. Dempsey | 3 |
| **COSTA RICA, CENTRAL AMERICA** | |
| Capt. Edward J. Dempsey | 5 |
| **GUATEMALA, CENTRAL AMERICA** | |
| Capt. Carlos Diaz | 5 |
| Capt. Juan Herrera | 5 |
| **NICARAGUA, CENTRAL AMERICA** | |
| Capt. Juan Herrera | 10 |
| **MIDWAY ISLAND, U.S.A.** | |
| Capt. Chris Sheeder | 2 |
| **MARSHALL ISLANDS, U.S.A.** | |
| Capt. Leigh Tobin | 3 |
| **FIJI ISLANDS** | |
| Capt. Albert A.W. Threadingham | 2 |
| **VANUATU** | |
| Capt. Renny Frouin | 3 |
| **MALDIVE ISLANDS** | |
| Capt. Gilles Sandrin | 3 |

## TAG RECOVERIES IN 1998

Seven (7) recaptures of billfish were reported in 1998 including: two striped marlin and five sailfish (Table 6). Unfortunately the release information (Billfish Tagging Report card) has not yet been received for an unidentified billfish captured near Tahiti. Please check your records, tackle boxes, salon cabinets, etc., for any of the yellow Billfish Tagging Report cards which may have been completed but inadvertently have not yet been mailed to the SWFSC. Tag and release does no good if we do not receive the release information here at the SWFSC.

Of the two recaptured striped marlin in 1998, one was tagged off Cabo San Lucas, Mexico and the other off Kailua-Kona, Hawaii. Both were recaptured within one month of release and had moved minimal distances (Table 6). This year we received no blue marlin recaptures. Five (5) of 96 sailfish tagged and released in the Persian Gulf were recaptured in 1998 and late 1997. The first of these recoveries spawned several incorrect news reports that a marlin had traveled from California to the Persian Gulf. All five were tagged and released in the south of the Gulf, near Abu Dhabi (United Arab Emirates), and were recaptured by Iranian fishermen after traveling northwest 153

**Table 6.** Tag recovery information.

| TAGGER/CAPTAIN | RELEASE DATE | RELEASE LOCATION | RECOVERY DATE | RECOVERY LOCATION | DAYS FREE | MILES/ DIRECTION TRAVELED |
|---|---|---|---|---|---|---|
| **STRIPED MARLIN** | | | | | | |
| Barry H. Bovee<br>John Jordan | 01/12/98 | 19°08'N 155°58'W<br>Kailua-Kona, HI | 02/02/98 | 19°23'N 155°59'W<br>C buoy, Kailua-Kona, HI | 21 | 15 - NNW |
| Gene Winger<br>Billy Miyagawa Jr. | 03/24/98 | 23°52'N 111°24'W<br>West of Cabo San Lucas, Mexico | 04/18/98 | 22°48'N 109°53'W<br>Cabo San Lucas, Mexico | 25 | 111 - ESE |
| **SAILFISH** | | | | | | |
| John Hoolihan | 02/18/98 | 24°49'N 054°18'E<br>Abu Dhabi | 06/05/98 | 28°23'N 050°42'E<br>Persian Gulf | 107 | 288 - WNW |
| John Hoolihan | 12/20/97 | 24°42'N 054°06'E<br>Abu Dhabi | 06/18/98 | 29°35'N 049°52'E<br>Persian Gulf | 180 | 388 - NNW |
| John Hoolihan | 11/30/97 | 24°48'N 054°13'E<br>Abu Dhabi | 05/09/98 | 27°14'N 052°34'E<br>Persian Gulf | 160 | 176 - NNW |
| John Hoolihan | 02/19/98 | 24°49'N 054°19'E<br>Abu Dhabi | 05/20/98 | 28°20'N 050°40'E<br>Persian Gulf | 90 | 304 - WNW |
| John Hoolihan | 02/26/98 | 24°49'N 054°18'E<br>Abu Dhabi | 05/13/98 | 26°47'N 052°31'E<br>Persian Gulf | 76 | 153 - NNW |
| **UNIDENTIFIED BILLFISH** | | | | | | |
| NO DATA, A26738 | - | - | 12/19/98 | 18°59'S 151°23'W<br>Tahiti, French Polynesia | - | - |
| **SHORTFIN MAKO SHARK** | | | | | | |
| NO DATA, A34520 | - | - | 03/27/98 | 19°23'N 155°59'W<br>C buoy, Kailua-Kona, HI | - | - |
| **THRESHER SHARK** | | | | | | |
| NMFS Shark LL<br>Research Cruise | 07/14/98 | 32°56'N 117°17'W<br>off Del Mar, CA | 12/14/98 | 33°30'N 117°57'W<br>off Newport Beach, CA | 153 | 48 - WNW |
| NMFS Shark LL<br>Research Cruise | 07/13/98 | 34°01'N 118°40'W<br>Santa Monica Bay, CA | 12/06/98 | 34°01'N 118°41'W<br>Santa Monica Bay, CA | 146 | 0 |
| **WAHOO** | | | | | | |
| J. I. McKechnie<br>Bill Boagey | 08/22/97 | 28°14'N 177°22'W<br>Midway Atoll, HI | 03/08/98 | 04°49'N 161°11'W<br>Washington Is.,<br>and central Pacific | 198 | 1707 - SSE |

to 388 nmi. Additional non-billfish tag recaptures included two common thresher sharks, tagged during a SWFSC shark assessment survey off Southern California and one wahoo tagged off Midway Island.

## TO RELEASE OR NOT TO RELEASE

All but one of the common arguments against catch and release have now been debunked. Foreign fishermen do not locate schools of fish from tag recapture data. Commercial longline fishermen from many Pacific rim countries fanned out across the Pacific during the early 1950s and had located all large areas of tuna, billfish and swordfish abundance by the end of that decade. Some have argued that the scientific results of tagging programs are never used. That is just not true. There are a number of published research studies showing results of post-release survival, hooking mortality, benefit of circle hooks, migration and behavior patterns, spawning areas, conservation effects, economic benefits and the importance of angler involvement.

The one remaining question, of whether all billfish can survive catch and release, is not likely to be answered definitively very soon. Every angler has his or her opinion as to the value of catch, tag and release. There is no doubt that some billfish die from the injuries and trauma of capture and release. Whether an angler believes in catch and release or not may even depend on his of her angler skills. The expertise in which an angler plays, controls, tags and releases a catch has a lot to do with survival after release.

There are many gear and handling techniques that improve survival of released billfish. Three major causes of mortality are 1) mortal injuries caused by the hook or leader resulting in damage to the stomach, gills, or throat, 2) improper handling at the side of the boat resulting in physical trauma to the head and gill cover, 3) excessive exhaustion caused by playing or fighting the fish for long periods of time resulting in oxygen depletion and a build up of carbon dioxide and lactic acid in the blood and muscle tissue.

Improving post-release survival starts with rigging your fishing gear. Use of heavy line appropriate for the targeted fish will allow you to bring the fish to leader quickly. The longer a fish is allowed to fight (or played) the greater the oxygen debt and build up of carbon dioxide. Fish released quickly have less time for physiological damage to occur. When fishing with plastic lures use only a single circle hook or J hook; no tandem rigs. This reduces both hook related injuries and the time needed to remove a second hook. Use single circle hooks when fishing bait (live or dead) to reduce "gut hook" injuries. Most suppliers of fishing equipment now carry a large selection of quality, big gamefish circle hooks.

Catch and release does work. Acoustic tracking studies on striped marlin by this SWFSC showed proper handling techniques allow them to recover quickly from the trauma of catch and release. In these studies, 20 striped marlin tagged with acoustic transmitters off southern California, Cabo San Lucas, and Kailua-Kona, Hawaii were tracked for periods of 24 to 48 hours. The behavior patterns of these fish took on characteristic and familiar patterns soon after release. All were swimming normally and some were observed feeding at the end of the tracking period. Two fish were rejected from tagging in these studies due to poor condition. One was tail wrapped and nearly dead when leadered and the other was injured at the side of the sport boat while thrashing against the transom. Additional techniques are listed in the section titled "Successful Catch, Tag and Release."

## CIRCLE HOOKS VS. J HOOKS

Use of circle hooks when fishing billfish is gaining popularity among a great many anglers. In theory, when a marlin strikes a live bait it is swallowed increasing the probability of gut or throat related injuries. Artificial lures slide up the leader when the billfish strikes and the hooks usually catch in the mouth parts and are not swallowed. J hooks that are swallowed often lead to mortal internal injuries not visible to the angler. Circle hooks have the tip bent inwards and are less likely to catch in the smooth tissues of the stomach, throat or gill area. In either case it is critical that the angler makes every attempt to reduce potential injuries of the billfish intended for release.

The tip on circle hooks appears to be oddly designed as the tip is bent inward toward the shank of the hook. Originally used by Pacific Islanders to avoid snagging on coral reefs, it was soon discovered most fish were hooked in the jaw. The theory maintains circle hooks slide past the soft tissue of the gut but bites into the corner of the mouth where it catches on the jaw hinge. Gap between the point and the shank is pulled over the jaw hinge. Because the point of the circle hook is in alignment with the leader it more effectively transfers maximum pressure to the point of the hook. Once imbedded it is almost impossible to back out because of this shape.

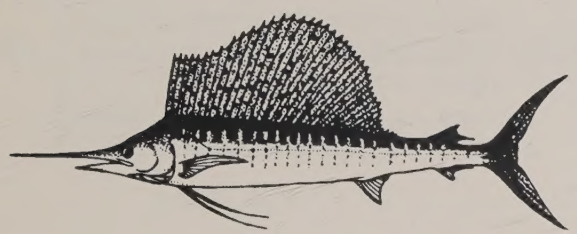
In our own juvenile shark assessment survey, circle hooks reduced gut hooking in mako sharks by almost 90%. Anglers fishing bluefin tuna in the Cape Hatteras sport fishery have also reported success in reducing gut hookings. A study by hook types by the California Department of Fish and Game showed that survival of released, undersized salmon was greatly improved using

circle hooks in the recreational salmon mooching fishery. Several commercial longline fisheries have switched to circle hooks because fish rarely escape from circle hooks and the hooking rate was at least as good as with J hooks.

There are some differences in handling techniques when using circle hooks. For example setting a circle hook with a quick jerk could pull the hook right out of the fish's mouth. Rather, allow the fish to run a short distance and then increase drag steadily. If you intend to release your catch, why not try circle hooks?

## NEW 'HM' TAGS SUPPLIED IN 1999

The design of billfish tags has changed. This year, the SWFSC will supply the new Highly-Migratory (HM) tags with nylon anchor tips. Recently completed studies show the HM series tags have superior tag retention characteristics and result in fewer wound infections. The new HM tags require a new design of the applicator pin. These will be provided with the new tags. The actual tagging procedure will not change markedly with the new HM tags. Please review the 'SUCCESSFUL CATCH, TAG AND RELEASE' section below. Anglers should continue to use your current supply of billfish tags until gone. The HM tags will be issued as needed. Please read the following recommendations for constructing your tagging pole with the new applicator pin.



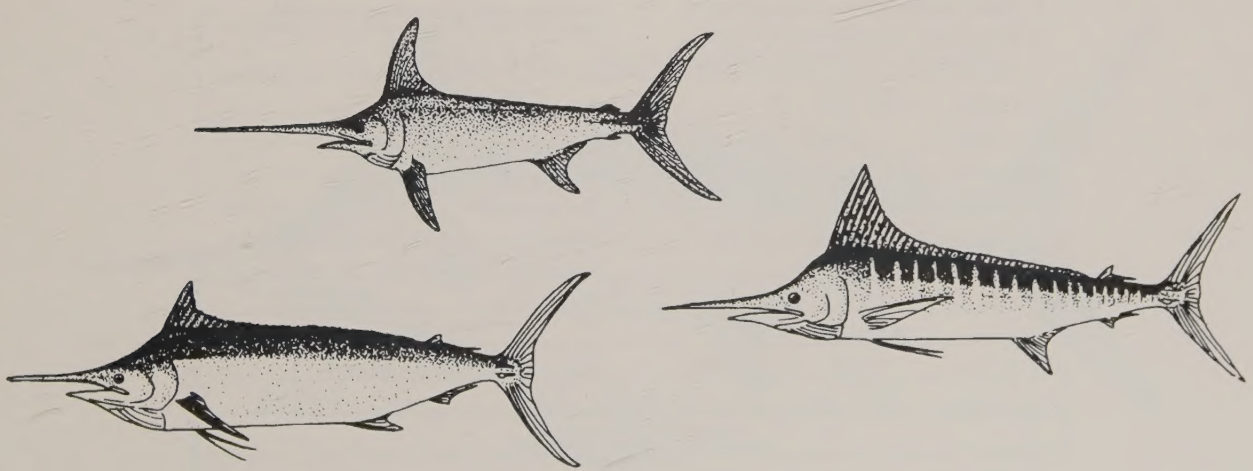
## Results of AFTCO's Pacific Tag-Flag Tournament

The winners of AFTCO's first Pacific Tag Flag Tournament were acknowledged last February at a banquet sponsored by The Billfish Foundation. This tournament, popular on the east coast, was conducted for the first time in the Pacific. The Tag Flag Tournament promotes the conservation of highly migratory species through tag and release programs and is supported by numerous organizations including the International Game Fishing Association, The Billfish Foundation, National Coalition for Marine Conservation, American Sportfishing Organization, and many popular sportfishing publications.

Captains and anglers who tagged Pacific billfish, bluefin tuna, thresher and mako sharks (and returned the completed BILLFISH TAGGING REPORT cards) were automatically entered in the tournament. The SWFSC supplied tagging supplies to participating anglers tagging billfish and bluefin tuna and provided AFTCO Tournament officials with the results of our 1998 billfish tag releases.

Tournament winners are shown below by category with number of fish tagged in ():

| Catagory | Captain | Angler |
|---|---|---|
| Blue Marlin<br>Black Marlin | Kelly Everett (22)<br>Kailua-Kona, HI | Mark Brachman (8)<br>Pasadena, CA |
| Striped Marlin | Julio Cote (75)<br>Las Barrilies, BCS | John Duval (20)<br>Sugarland, TX |
| Sailfish | Ron Hamlin (446)<br>Fort McCoy, FL | Joe Rich (31)<br>Atlanta, GA |
| Mako Shark<br>Thresher Shark | Deara Poe (103)<br>Redondo Beach, CA | Keith Poe (103)<br>Redondo Beach, CA |
| Bluefin Tuna | N/A | Ben Levy (8) |
| **Overall performance awards for the year went to:** | | |
| Captain of the year - Capt. Ron Hamlin for Pacific Ocean | | |
| Angler of the year - Don Anderson for Pacific Ocean | | |



## SUCCESSFUL CATCH, TAG AND RELEASE

Yes, billfish can be caught, tagged and released with very little harm. The success of releasing your billfish depends on several decisions' you, the angler, must make prior to and during fishing. Following is a guide that will enhance post-release survival of your billfish.

### 1. BEFORE YOU CATCH YOUR FISH:

- First decide if this fish is to be tagged and released.
- Rig terminal tackle with a single, circle hook for both live and dead bait fishing. Use a single circle hook or single 'J' hook when fishing with a plastic lure. Do not use double 'J' type hooks if you intend to release your catch.
- Have the tagging pole, with tag attached, stashed in a safe but handy location.
- Place the BILLFISH TAGGING REPORT card in a safe and dry location.

### 2. WHILE FISHING:

- Bring your fish to leader as quickly as possible.
- Allow the fish time to calm down prior to tagging.
- Never attempt to tag a fish while it is jumping or thrashing around.

### 3. TAGGING:

- Lead the fish along side as the boat is slowly moving ahead.
- As soon as the fish is calm and being towed alongside, insert the tag in the dorsal back muscle just below and behind the tallest part of the dorsal fin. Avoid the gills, head or stomach. OR, if needed, have your deck hand firmly grasp and hold the fish by the bill while you insert the tag.
- The tag should be inserted a full 2.5 inches into the muscle at an angle matching the flow of water passing over the fish's back.
- Avoid excessive handling or allowing your fish to injure itself on the vessel's hull or transom.

### 4. RELEASING:

- Remove the hook with a good pair of pliers. If deeply hooked in the throat or stomach, release it by cutting the leader as close to the hook as possible.
- A fish that appears lethargic, but otherwise not injured, can often be revived by slowly towing it through the water, forcing water through the gills until it begins to swim on its own. Even a fish that has thrown its stomach can still be released successfully.

### 5. COMPLETING THE BILLFISH TAGGING REPORT CARD:

- Fill out completely and as accurately as possible.
- Indicate latitude, longitude and local name of fishing area
- Enter date of release (month/day/year)
- Estimate the length of the fish as:
  1) "eye-to-fork" length (EFL)
  2) "tip of lower jaw-to-fork" length (JFL)
- Include any remarks, club name and complete address' of the angler and boat captain.
- Return cards promptly to the Southwest Fishery Science Center.
- Tagging is of no value unless this Billfish Tagging Report card is returned.

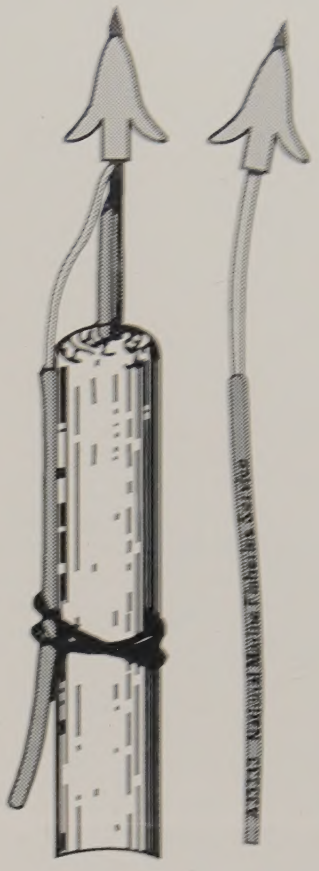
NOAA, National Marine Fisheries Service
BILLFISH TAGGING REPORT
PLEASE FILL IN DETAILS AND MAIL TODAY. TAG #: A33333

If mailing outside USA, postage must be affixed
Please return card, Otherwise tagging is of no value

Latitude: 33° 14' N Longitude: 118°14' W
Locality: East End Catalina Is. CA
Species: Striped Marlin Date: 6/10/98
Estimate length (tip of jaw to fork of tail): 72 inches. Weight: 140 lbs.
Fish Condition: Good Bait type: Plastic Lure
Angler: Bill Fish Fight time (minutes): 23
Address: P.O. Box 271 La Jolla, CA Zip: 92038
Club: Anglers Club
Captain: Capt. Joe Dew Boat name: Good Grief
Address: P.O. Box 271 La Jolla, CA Zip: 92038

Response to this form is voluntary.
OMB 0648-0009, expiration date 08/31/2001
NOAA 88-162, 2/99

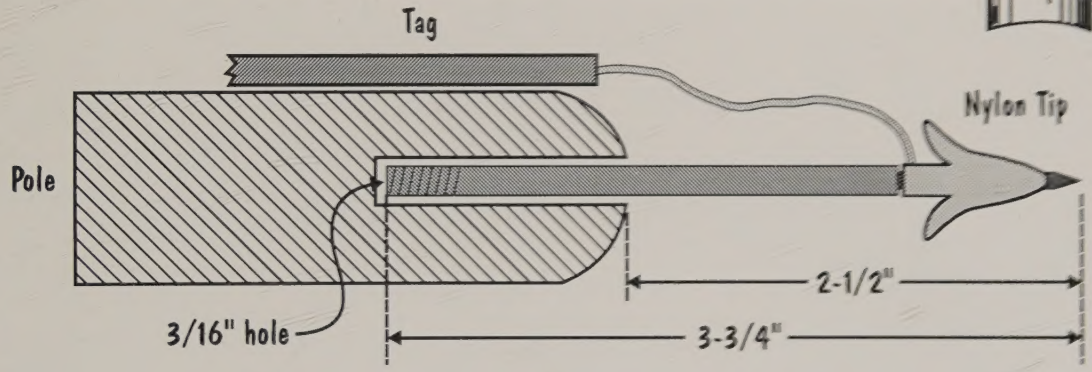
## CONSTRUCTION OF YOUR TAGGING POLE

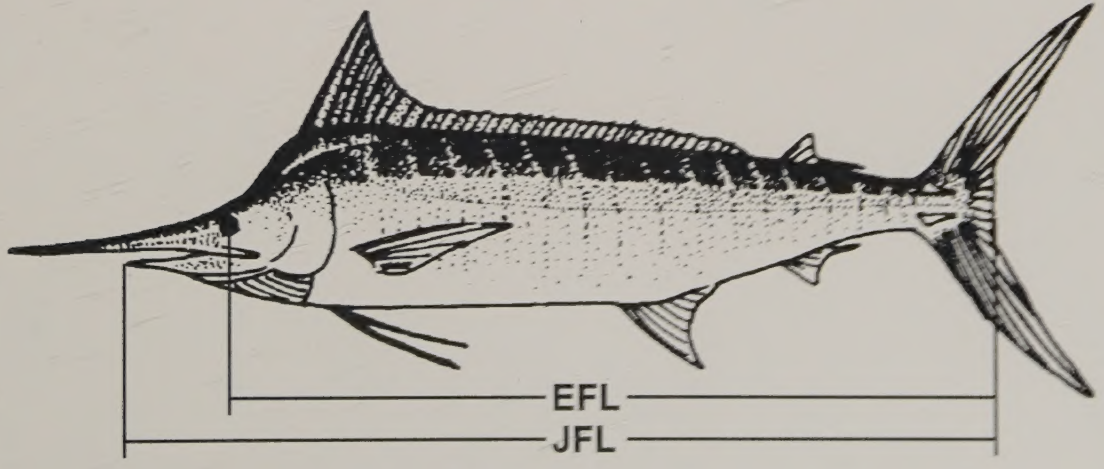


It is important that the billfish tag be applied in the proper location, at the proper angle, and be inserted far enough into the dorsal back muscle of the fish to adequately anchor the tag.

The fish should be tagged in the area just below the forward part of the dorsal fin. The tag should be inserted into the fish a full 2.5 inches (6.3 cm). Manufactured tagging poles are available at most retail sportfishing stores. It is important to check the length of the applicator pin installed on these poles to ensure the tip extends only 2.5 inches. Some manufacturers have changed the overall length of the pins in which case the stopper must be adjusted to only allow the 2.5 inch penetration into the fishes back.

If you choose to construct your own tagging pole, an old broom or mop handle makes the best tagging poles. They are made of hardwood, about 5 feet long and 1 inch in diameter which makes them sturdy and reliable. A tag tip hole should be drilled with a 3/16 inch or No. 16 drill bit to a depth of 1.25 inches (see diagram below). Use a good grade epoxy to secure the applicator pin in the pole and seal the hole to saltwater.



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Honolulu, HI 96822-2396



## SEND US YOUR PHOTOGRAPHS

**The Southwest Fisheries Science Center is looking for good photographs of billfish for the cover of next year's Billfish Newsletter. Color or black-and-white photos of billfish and/or fishing activities are appropriate. We would appreciate your sharing of photos and will give you full credit in the 2000 issue. A billfish baseball cap and plaque will be awarded to the winning photographer. This year's winning cover photograph was taken by Marc Muller of the San Diego Marlin Club aboard the Abseas during the 1989 North-South Shoot-off Tournament.**

## ACKNOWLEDGEMENTS

**The information reported here would not be possible without the cooperation of thousands of anglers and volunteers who support these investigations. Your efforts and assistance are greatly appreciated. We welcome reader comments and suggestions concerning the content of the *Billfish Newsletter*.**

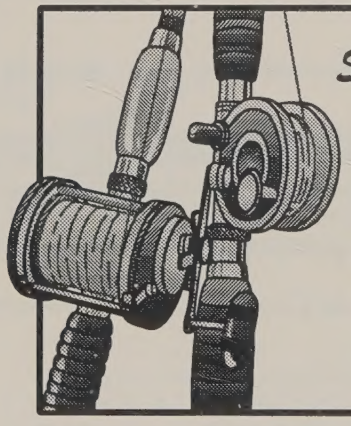
**Roy Allen and Henry Orr designed the newsletter.**

## WEB SITE

**The *Billfish Newsletter* can also be accessed on the Southwest Fisheries Science Center's home page under 'Publications' at http://swfsc.ucsd.edu.**

## PAPER REDUCTION ACT NOTIFICATION

**The federal Paper Reduction Act requires we provide reporting burden to all Survey respondents and billfish taggers. The reporting burden to complete the Billfish Angler Survey card and the Billfish Tagging Report is estimated to average five minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate to the SWFSC, P.O. Box 271, La Jolla, Ca 92038. Notwithstanding any other provision of the law, no person is required to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.**



*Smooth seas and good fishing,*

*David B. Holts, Biologist*
*Douglas Prescott, Computer Specialist*

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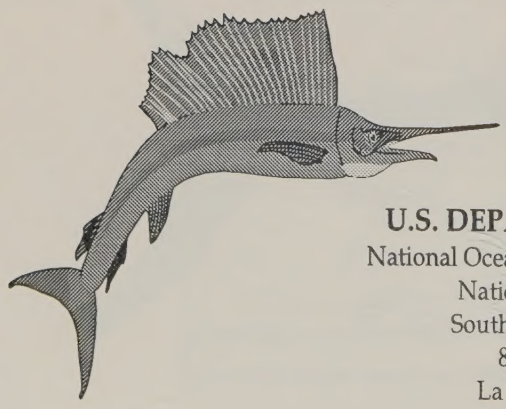

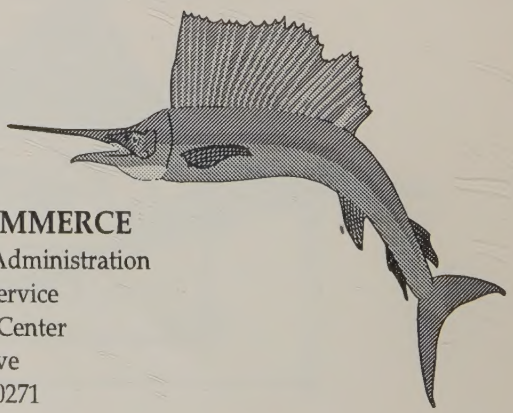

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